

BSP Thread

The BSP (British Standard Pipe) thread form is widely used in Australia and other Commonwealth countries. It is defined by trade size rather than actual diameter, which can sometimes confuse when measuring ports. There are two types of BSP threads:

BSPP (British Standard Pipe Parallel) Both female and male threads are parallel. It is also known as G.

BSPT (British Standard Pipe Tapered) The female thread is parallel, and the male thread is tapered. This type is also referred to as R/Rp.

Occasionally, the female thread can be tapered, in which case it is called Rc, though this is relatively rare. It's common to refer to the female thread as BSPP (parallel) and the male thread as BSPT (tapered), even though both technically belong to the BSPT thread form (parallel female and tapered male). Both BSPP and BSPT threads share the same pitch, angle (55 degrees), and shape (rounded peaks and valleys).

Below is a table indicating the major and minor diameters for each BSP Trade Thread Size. Note that the minor diameter may vary slightly depending on the manufacturing specifications used for the thread gauge.

Trade Size		1/8	1/4	3/8	1/2	3/4	1	1 ¼	1 ½	2	2 ½	3	4
Threads per inch		28	19	19	14	14	11	11	11	11	11	11	11
Pitch	Inch	0.0357	0.0526	0.0526	0.0714	0.0714	0.0909	0.0909	0.0909	0.0909	0.0909	0.0909	0.0909
	mm	0.907	1.337	1.337	1.814	1.814	2.309	2.309	2.309	2.309	2.309	2.309	2.309
Major Diameter	Inch	0.383	0.518	0.656	0.825	1.041	1.309	1.65	1.882	2.347	2.96	3.46	4.45
	mm	9.728	13.157	16.662	20.955	26.441	33.249	41.91	47.803	59.614	75.184	87.884	113.03
Minor Diameter	Inch	0.3372	0.4506	0.5886	0.7336	0.9496	1.1926	1.5336	1.7656	2.2306	2.8436	3.3436	4.3336
	Mm	8.565	11.445	14.95	18.633	24.12	30.292	38.953	44.846	56.657	72.227	84.927	110.073
Gage Length	Inch	0.1563	0.2367	0.25	0.3214	0.375	0.4091	0.5	0.5	0.625	0.6875	0.8125	
	mm	3.97	6.012	6.35	8.164	9.525	10.391	12.7	12.7	15.875	17.463	20.638	

NPT Thread

NPT (National Pipe Thread) is an American standard thread type. It can also be referred to as:

- MPT, MNPT, or NPT(M) for male external threads
- FPT, FNPT, or NPT(F) for female internal threads

A thread sealant is typically required to ensure a leak-free seal, except for NPTF threads. Like BSP, NPT threads are defined by trade size rather than actual diameter. NPT threads have the same pitch, angle (60 degrees), and shape (flat peaks and valleys).

Below is a table showing the Threads Per Inch (TPI), pitch, and major diameter for NPT threads.

Trade Size		1/8	1/4	3/8	1/2	3/4	1	1 ¼	1 ½	2	2 ½	3	4
Threads per inch		27	18	18	14	14	11 ½	11 ½	11 ½	11 ½	8	8	8
Pitch	Inch	0.04	0.06	0.06	0.07	0.07	0.09	0.09	0.09	0.09	0.13	0.13	0.13
	mm	0.94	1.41	1.41	1.81	1.81	2.21	2.21	2.21	2.21	3.18	3.18	3.18
Major Diameter O.D)	Inch	0.41	0.54	0.68	0.84	1.05	1.32	1.66	1.9	2.38	2.88	3.5	4.5
	mm	10.3	13.7	17.2	21.3	26.7	33.4	42.2	48.3	60.3	73	88.9	114

BSP vs. NPT Thread

NPT (National Pipe Thread) is commonly used in the United States and a few other countries, while BSP (British Standard Pipe), also known as the R subset according to ISO 7, is widely used in many other countries.

Thread Types:

- BSPT (British Standard Pipe Taper)
- BSPP (British Standard Pipe Parallel, also known as G)
- NPT (National Pipe Taper)
- NPS (National Pipe Straight)
- R (External taper, ISO 7)
- Rp (Internal parallel, ISO 7/1)
- Rc (Internal taper, ISO 7)
- Rs (External parallel)

While the actual specified outside diameters of American National Pipe differ slightly from those of British Standard Pipe, either thread can reliably be cut onto a pipe of its respective trade size. BSPT's equivalent is NPT, and BSPP's equivalent is NPS. Important Note: Never swap threads in high-pressure applications.

Compatibility:

NPT/NPS and BSP threads are not compatible due to differences in their thread forms, not just the fact that most sizes have different pitches.

NPT/NPS threads have a 60° angle with flattened peaks and valleys (Sellers thread form), whereas BSP threads have a 55° angle with rounded peaks and valleys (Whitworth thread form).

To determine thread pitch, use a thread gauge or count the number of threads in a 1" span. Below is a comparison of NPT and BSP thread pitches (threads per inch).

Trade Size		1/8	1/4	1/8	1/2	3/4	1	1 1/4	1 1/2	2	2 1/2	3	3 1/2	4	5	6
Pitch (Threads per Inch)	NPT/NPS	27	18	18	14	14	11 1/2	11 1/2	11 1/2	11 1/2	8	8	8	8	8	8
	BSP	28	19	19	14	14	11	11	11	11	11	11	11	11	11	11

How to Measure Threads

To identify the trade size of a thread, follow these steps:

- Determine Thread Type (Tapered or Parallel):
- Measure the first, fourth/fifth, and last full thread.
- If the diameter increases from the first to the last thread on a male thread or decreases from the first to the last thread on a female thread, the thread is tapered (e.g., BSPT).
- If the diameter remains the same from the first to the last thread, the thread is parallel (e.g., BSPP).

Measure for Trade Size:

- Parallel Threads: Any thread can be used to measure for its trade size.
- Tapered Threads: Measure the fourth or fifth full thread to determine the trade size.

Note that the measured size may not directly correspond to the trade size. For example, a 1/2" BSP does not equal a 1/2" measured diameter.

Reference Against a Thread Table:

- Once you have the measurement, compare it against a thread table to match it to its trade size.

Note: Dimensions may differ slightly between the measured size and the trade size due to variances in measuring and manufacturing tolerances.

